

Foam Optics And Mechanics (FOAM)



Glenn Research Center

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ESA PIs: Langevin, Saint-Jalmes, Adler (France); Vanderwalle (Belgium);
 Waiere (Ireland); Odenbach, Barnhardt (Germany); Kronberg (Sweden)
Hardware Development/Engineering: ESA , Major contractor EADS

SCIENCE OBJECTIVES:

- ♦ To exploit microgravity conditions to quantify and elucidate the unusual elastic character of foam structure and dynamics.
- ♦ To observe how the foam melts into a simple viscous liquid as a function of both increasing liquid content and shear strain rate.

RELEVANCE/IMPACT:

- ♦ The proposed flight research generates valuable fundamental guidance for the development of materials with more a desirable rheology and better stability.
- ♦ On board Rheometry and light scattering techniques will provide the rheology and coarsening in terms of microscopic structure and dynamics.

DEVELOPMENT APPROACH: 3 SEPARATE FLIGHTS

FOAM STABILITY LAUNCHED MAY 2009

(INCREMENT 19, CARRIER: PROGRESS),

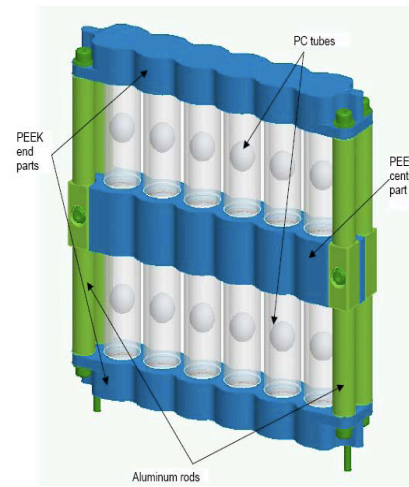
FOAM COARSENING CURRENTLY UNDER DEVELOPMENT BY ASTRUM
 (GERMAN CONTRACTOR) LAUNCH DATE: 2011 , CARRIER :PROGRESS

FOAM RHEOLOGY UNDER FLIGHT FEASIBILITY STUDY. (DATES,
 CARRIER TBD)

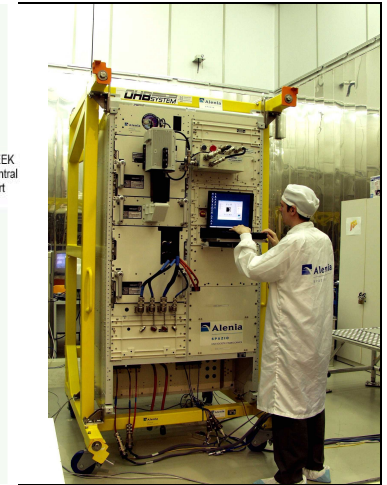
ESA will develop all hardware. US PIs funded by NASA.

Project Life Cycle Schedule

Milestones	PRR	SRR	PDR	CDR	TRR	FAR	FRR	Launch	Ops	Return	Final Report
Actual/ Baseline			Coarsening Sept 2009	Coarsenin Nov 2009				May 2011 (Coarsening)	2011	Aug. 2011	2012



FOAM Stability Test cells



ESA Fluids Science Lab

ISS Resource Requirements

Accommodation Carrier	FSL Fluids Science Laboratory Progress
Upmass (kg) (w/o packing factor)	50
Volume (m ³) (w/o packing factor)	
Power (kw) (peak)	
Crew Time (hrs) (installation/operations)	FOAM Coarsening (TBD)